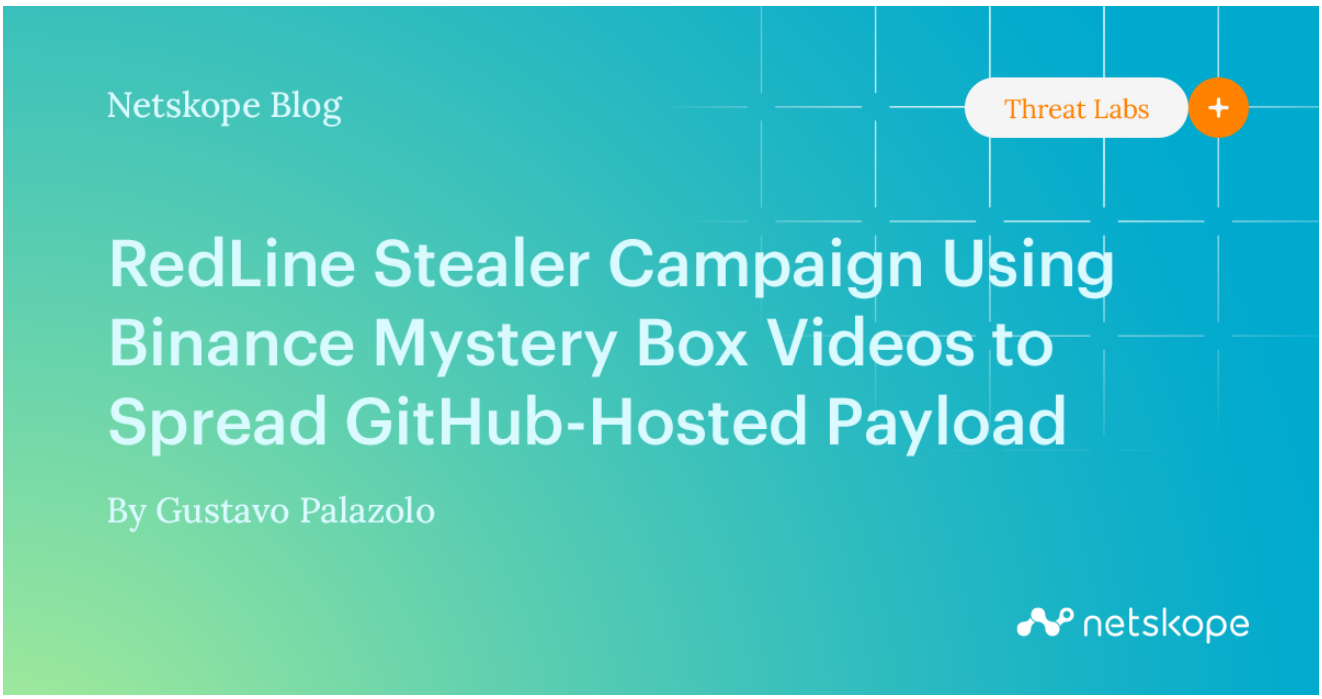
RedLine Stealer Campaign Using Binance Mystery Box Videos to Spread GitHub-Hosted Payload

netskope.com/blog/redline-stealer-campaign-using-binance-mystery-box-videos-to-spread-github-hosted-payload

Gustavo Palazolo May 12, 2022



Summary

RedLine Stealer is a malware that emerged in 2020, discovered in underground forums being sold in different plans, starting from $100 per month. The malware offers many capabilities for device reconnaissance, remote control, and information stealing, including:

- Data from browsers (e.g. login, passwords, credit cards, cookies, etc.);
- Data from Discord and Telegram (e.g. chat logs, tokens, etc.);
- VPN and FTP Credentials;

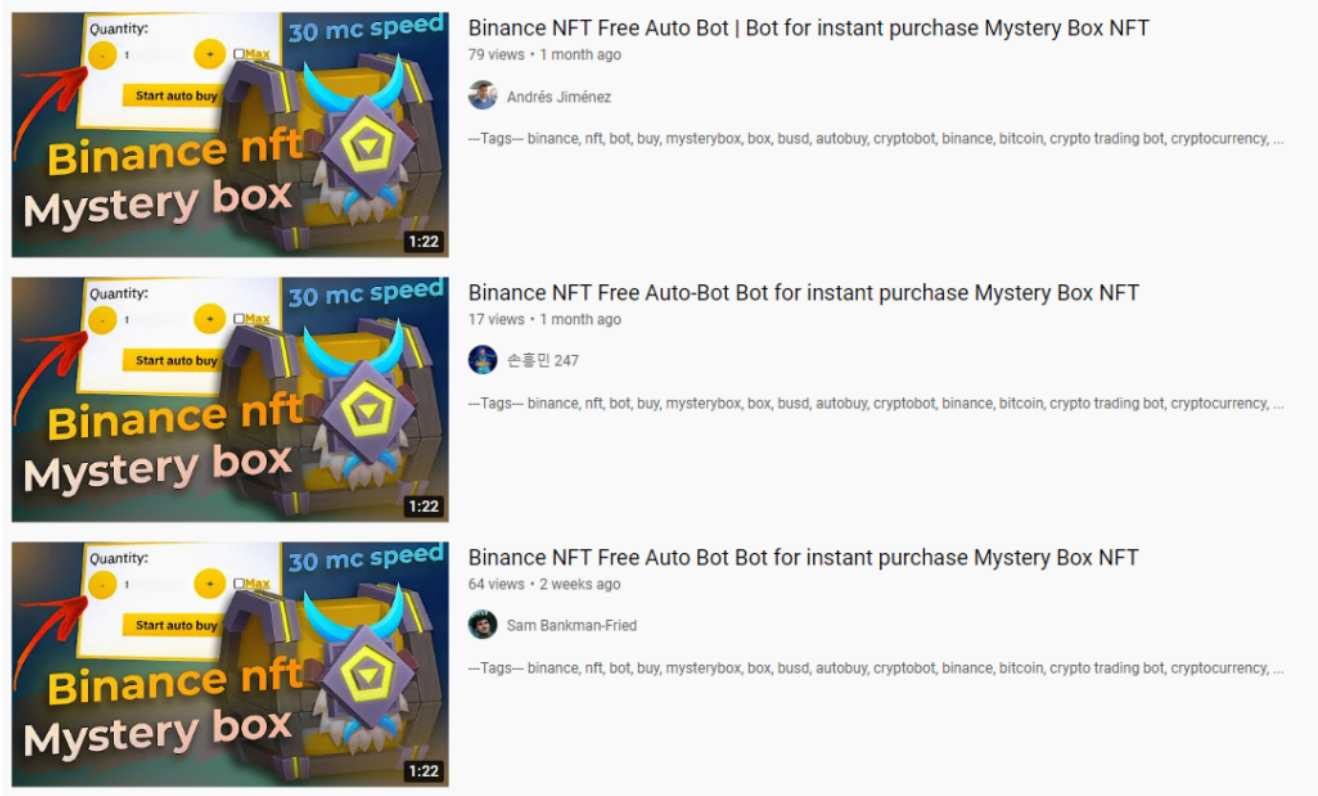
Since its discovery, attackers have used many different vectors to spread this stealer, including through fake installers and fake game hacking tools. Also, RedLine Stealer was found in compromised devices by the DEV-0537 hacking group (a.k.a. lapsus$).

In April 2022, Netskope Threat Labs identified a new RedLine Stealer campaign spread on YouTube, using a fake bot to buy Mystery Box NFT from Binance. The video description leads the victim to download the fake bot, which is hosted on GitHub.

In this blog post, we will analyze this campaign, showing how it's being spread and how the fake bot leads to RedLine Stealer.

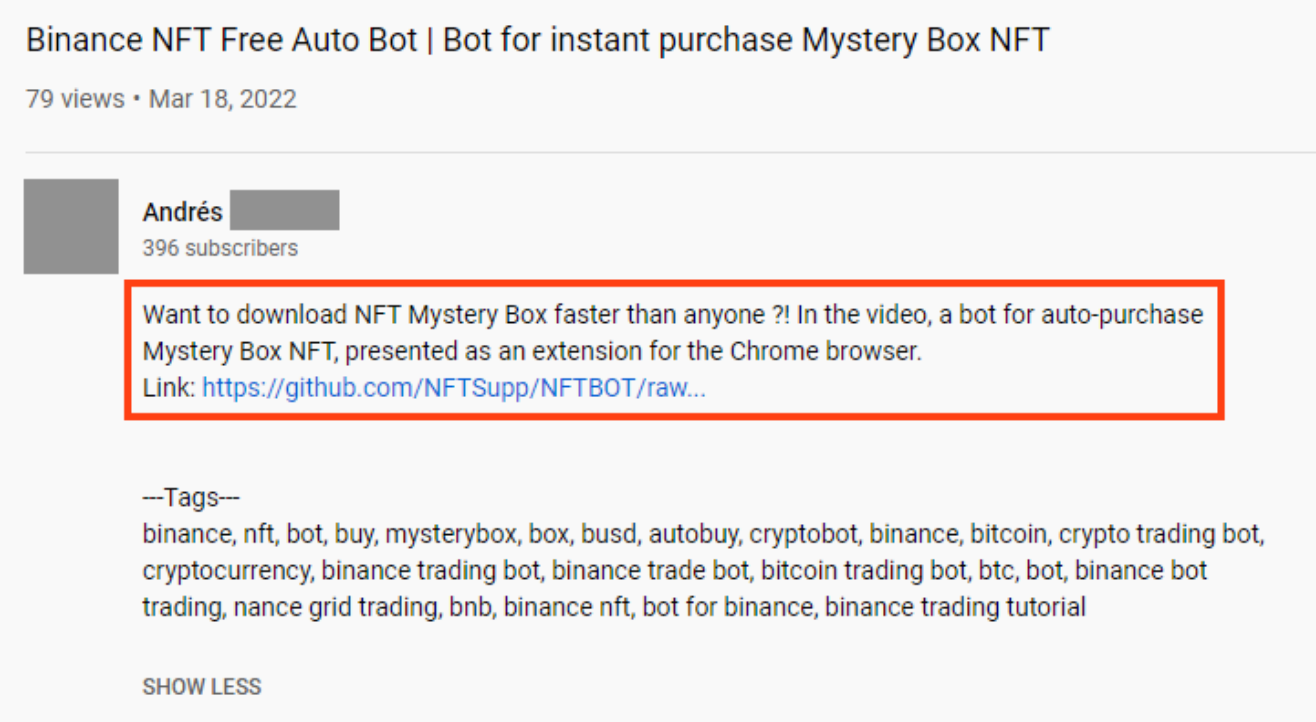
YouTube Videos

The malware is spread through YouTube videos that lure victims into downloading a fake bot to automatically buy Binance NFT Mystery Boxes. At this point, we found five videos across multiple channels that are part of the same campaign. All the URLs can be found in our GitHub repository.



Attacker spreading RedLine through YouTube video.

The video description provides details and the download link for the fake bot, which is supposed to be presented as a Chrome extension.

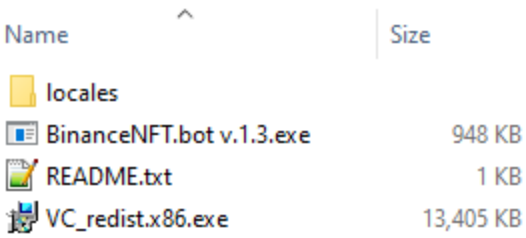


Video description with the link to download the fake bot.
The video description also contains different tags, probably to increase its visibility, including:

binance, nft, bot, buy, mysterybox, box, busd, autobuy, cryptobot, binance, bitcoin, crypto trading bot, cryptocurrency, binance trading bot, binance trade bot, bitcoin trading bot, btc, bot, binance bot trading, nance grid trading, bnb, binance nft, bot for binance, binance trading tutorial

Stage 01 – Loader

All the videos we found are pointing to the same GitHub URL, downloading a file named "**BinanceNFT.bot v.1.3.zip**".
Once we decompress the ZIP file, we have the packed RedLine sample ("**BinanceNFT.bot v.1.3.exe**") and a Microsoft Visual C++ Redistributable installer ("**VC_redist.x86.exe**").



Decompressed ZIP file downloaded from GitHub.

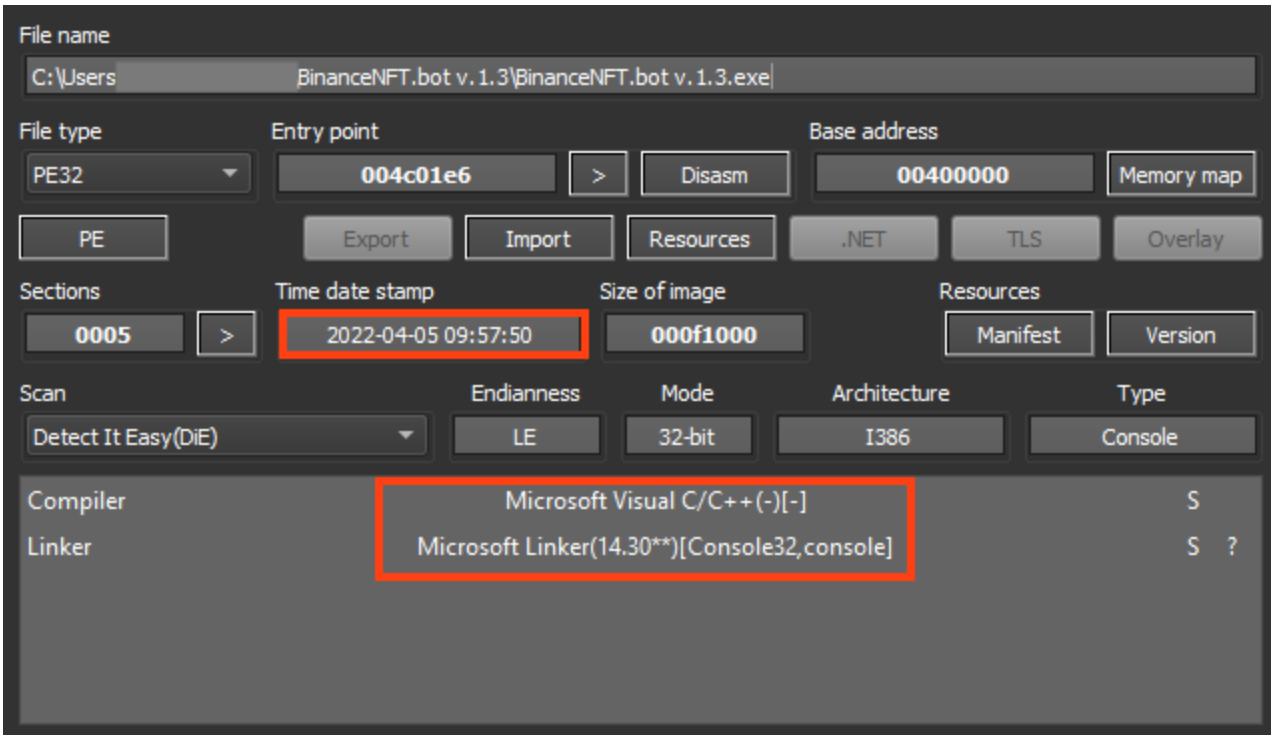
The "**README.txt**" file contains the instructions that should be followed to run the fake NFT bot, including installing the Microsoft Visual C++. This is probably needed as RedLine is developed in .NET and it is also unpacked and injected into an executable from this framework.

README.txt

```
1.Unzip the archive
2.Start the bot
3.Install the VC_redist.x86 library
4.Start using
Good luck!
```

Readme file.

The first stage was likely compiled on **April 5, 2022**, and it's responsible for decrypting and loading RedLine Stealer into another process.



Details of the packed RedLine Stealer sample.

The binary details also include values that seem to be copied from another executable, using "LauncherPatcher.exe" as the original filename.

```
4  PRODUCTVERSION 1,0,0,14
5  FILEOS 0x40004
6  FILETYPE 0x1
7  {
8  BLOCK "StringFileInfo"
9  {
10         BLOCK "040904b0"
11         {
12                 VALUE "CompanyName", "Rockstar Games"
13                 VALUE "FileDescription", "Rockstar Games Launcher Patcher"
14                 VALUE "FileVersion", "1.0.0.14"
15                 VALUE "InternalName", "LauncherPatcher.exe"
16                 VALUE "LegalCopyright", "Rockstar Games Inc. (C) 2005-2021
17 Take Two Interactive. All rights reserved.  "
18                 VALUE "OriginalFilename", "LauncherPatcher.exe"
19                 VALUE "ProductName", "Rockstar Games Launcher Patcher"
20                 VALUE "ProductVersion", "1.0.0.14"
21         }
22 }
23
```

Further details about the first stage.

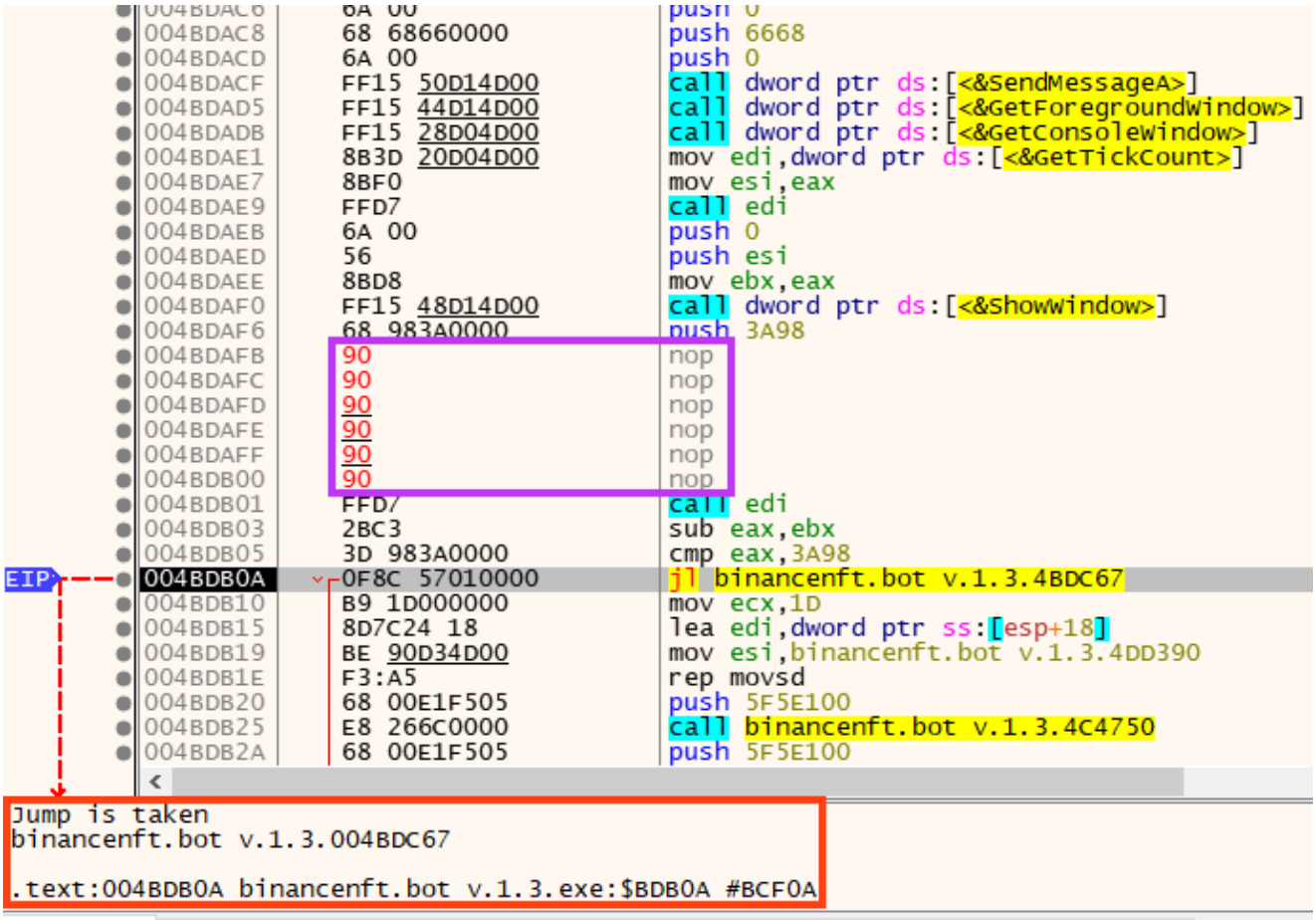
Many malware families use a trick to delay the execution of its functions, often to delay the execution inside sandboxes, which usually contain limited time of operation. As a result, there are sandboxes that are able to bypass this technique, by patching or hooking Sleep functions, for example.

This RedLine Stealer loader contains a simple trick to evade sandboxes with such functionality. Upon execution, it tries to delay the execution by 15 seconds and compares the timestamp (GetTickCount) before and after the Sleep API execution. If the elapsed time is less than 15 seconds, it exits the process.

```
call    ds:SendMessageA
call    ds:GetForegroundWindow
call    ds:GetConsoleWindow
mov     edi, ds:GetTickCount
mov     esi, eax
call    edi ; GetTickCount
push    0               ; nCmdShow
push    esi             ; hWnd
mov     ebx, eax
call    ds:ShowWindow
push    15000           ; dwMilliseconds
call    ds:Sleep
call    edi ; GetTickCount
sub     eax, ebx
cmp     eax, 15000
jl      exit
```

Trick to evade sandbox analysis.

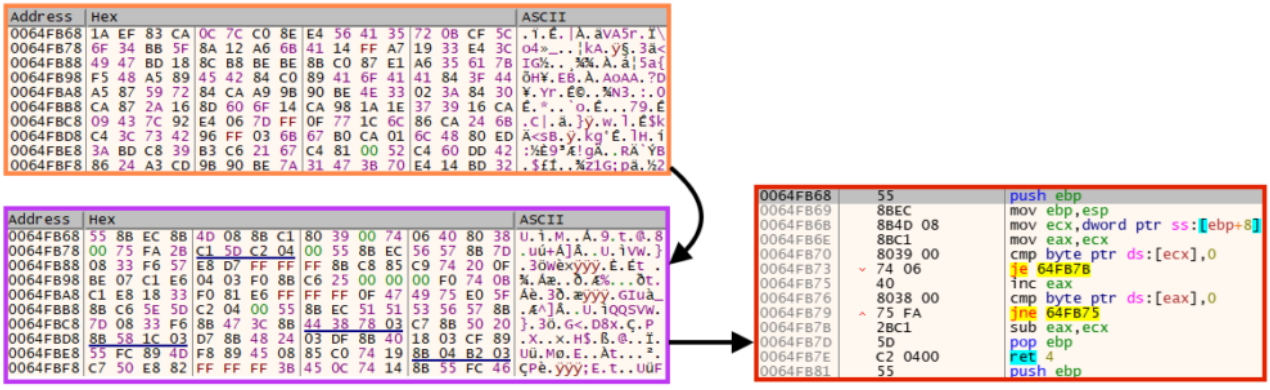
This can be tested by patching the Sleep function in a debugger.



RedLine loader exiting the process if the Sleep function is bypassed.

If the sandbox is not detected through this simple trick, it then decrypts the next stage using a simple rolling XOR algorithm with "**OdoAAtK**" as the key.

Loader decrypting RedLine Stealer payload.
Then, it executes a shellcode, which is decrypted using the same algorithm.



Loader decrypting and executing a shellcode.
And finally, the payload is injected to “**RegSvcs.exe**” using a simple process injection technique, similar to RunPE. We also found cases where a similar loader injects RedLine Stealer into “**AppLaunch.exe**”, as we will describe later.

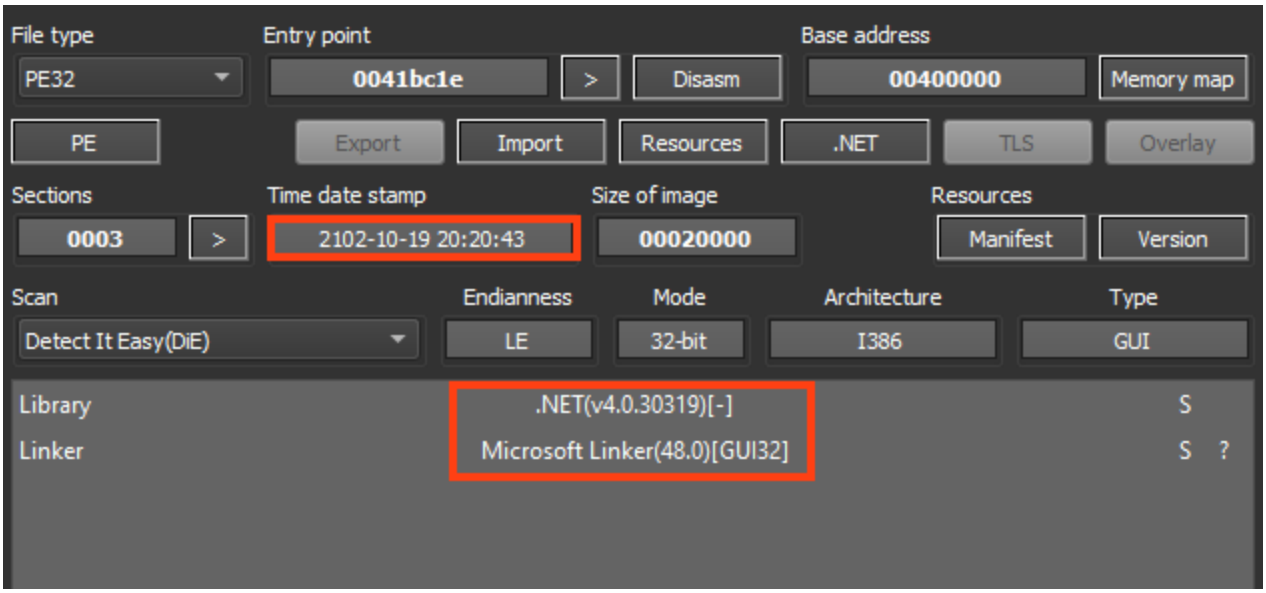
```
push eax
push edx
push edx
push 4
push edx
push edx
push edx
push dword ptr ss:[ebp+C]
push dword ptr ss:[ebp+8]          [ebp+8]:L"C:\\Windows\\Microsoft.NET\\Framework\\v4.0.30319\\RegSvcs.exe"
call dword ptr ss:[ebp-7C]
test eax,eax
je 7415B2
lea eax,dword ptr ss:  76A688E0 <kernel32.CreateProcessW>
push eax               mov edi,edi
push dword ptr ss:[eb  push ebp
call dword ptr ss:[eb  mov ebp,esp
test eax,eax           pop ebp
je 7415B2              jmp dword ptr ds:[<&CreateProcessW>]
xor eax,eax
```

Loader injecting unpacked RedLine Stealer into another process.

Stage 02 – Payload

RedLine Stealer is developed in .NET, and the compilation timestamp was altered in the binary, showing a date from the year 2102. Formbook was also using altered timestamp dates in its payloads, which is a common behavior for malware authors to deceive analysts/researchers.

Fortunately, RedLine Stealer uses a very nonsense date, which can be used for detection in Yara rules, for example.



RedLine Stealer payload details.

Once executed, the infostealer calls a function named "**Check**". If this function returns true, the malware exits its process.

```
// Token: 0x06000076 RID: 118 RVA: 0x00002E3D File Offset: 0x0000103D
private static void Main(string[] args)
{
    dnlibDotNetCustomAttributeV.WriteLine();
}

// Token: 0x06000077 RID: 119 RVA: 0x00005DF4 File Offset: 0x00003FF4
public static void WriteLine()
{
    try
    {
        if (dnlibDotNetMDRawExportedTypeRowP.Check())
        {
            Environment.Exit(0);
        }
```

RedLine Stealer “Check” function.

In summary, this function verifies if the malware is running in blocklisted countries, by comparing the country name with the OS region information.

```
// Token: 0x04000035 RID: 53
private static readonly string[] RegionsCountry = new string[]
{
    "Armenia",
    "Azerbaijan",
    "Belarus",
    "Kazakhstan",
    "Kyrgyzstan",
    "Moldova",
    "Tajikistan",
    "Uzbekistan",
    "Ukraine",
    "Russia"
};
```

This malware does not execute if any of these countries is detected:

- Armenia
- Azerbaijan
- Belarus
- Kazakhstan
- Kyrgyzstan
- Moldova
- Russia
- Tajikistan
- Ukraine
- Uzbekistan

We tested this by changing the OS language to Ukrainian. The malware uses the field “EnglishName” from the .NET RegionInfo Class to compare with the blocklist.

Наименование	Значение
regionInfo	{ru-UA}
CurrencyEnglishName	"Ukrainian Hryvnia"
CurrencyNativeName	"украинская гривна"
CurrencySymbol	"₴"
DisplayName	"Украина"
EnglishName	"Ukraine"
GeoId	0x000000F1
IsMetric	true
ISOCurrencySymbol	"UAH"

RedLine Stealer exits the process if a blocklisted country is found.

RedLine Stealer maintains a simple configuration, where the values are base64 encoded and encrypted with a rolling XOR algorithm.

```
// Token: 0x02000016 RID: 22
public static class SystemNetUnsafeNclNativeMethodsHttpApiHTTPREQUESTTOKENBINDINGINFOD
{
    // Token: 0x04000010 RID: 16
    public static string IP = "GTsoFyMhGCIiOTddKRkGXiIIJRw9AwRc";

    // Token: 0x04000011 RID: 17
    public static string ID = "DgIkFyIMR2c=";

    // Token: 0x04000012 RID: 18
    public static string Message = "";

    // Token: 0x04000013 RID: 19
    public static string Key = "Wombles";

    // Token: 0x04000014 RID: 20
    public static int Version = 1;
}
```

RedLine Stealer configuration.

The decryption key used by this sample is “**Wombles**”, and we can use a simple Python script to retrieve the C2 address value:

```
>>>
>>> def rl_decode(value, key):
...     b64 = b""
...     for i, b in enumerate(b64decode(value)):
...             b64 += chr(b ^ key[i % len(key)]).encode()
...     return b64decode(b64)
...
>>>
>>> rl_decode(b"GTsoFyMhGCIiOTddKRkGXiIIJRw9AwRc", b"Wombles")
b'51.89.155.45:22595'
>>>
>>>
```

Decrypting RedLine Stealer C2 address.

The “ID” value also uses the same algorithm:

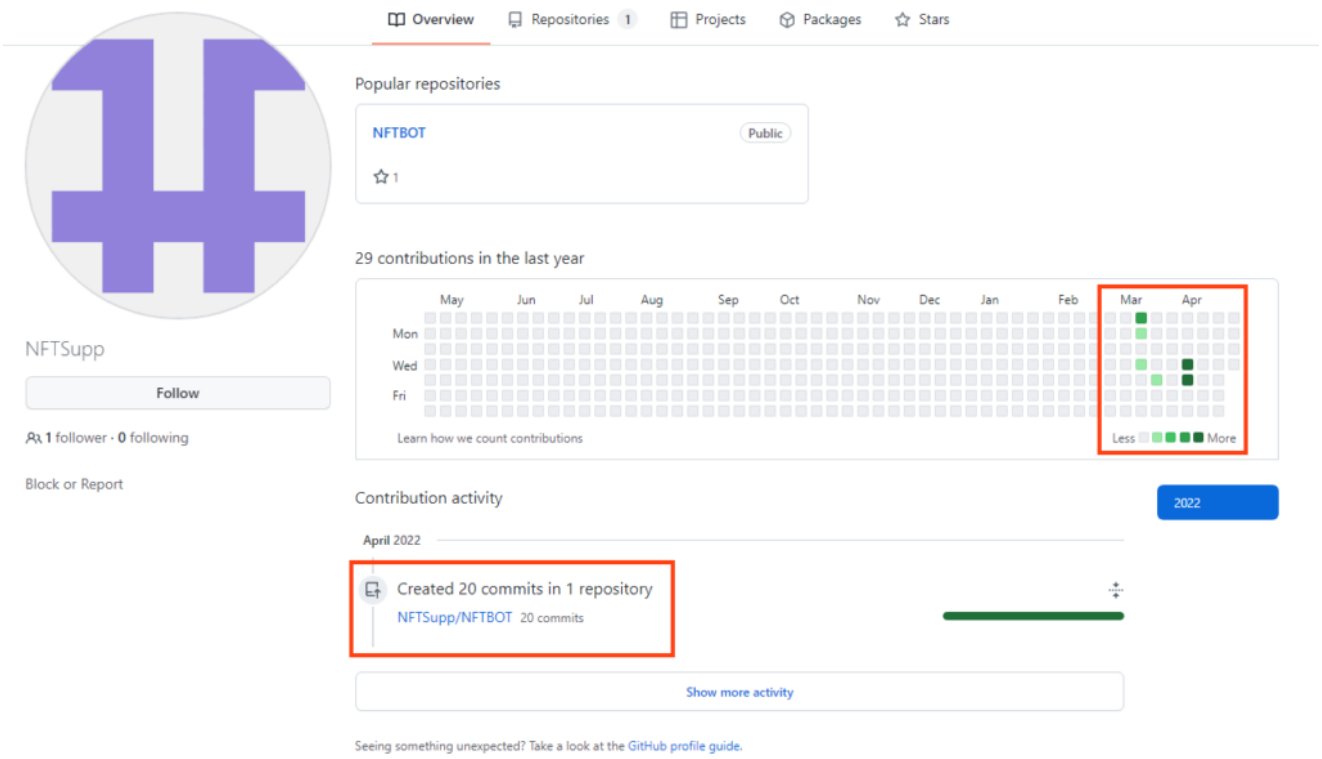
```
>>> rl_decode(b"DgIkFyIMR2c=", b"Wombles")
b'bb.6.4'
>>>
```
Decrypting RedLine Stealer ID.

As previously mentioned, RedLine Stealer offers many capabilities to the attacker, including stealing Discord tokens.

RedLine Stealer function that reads Discord tokens.

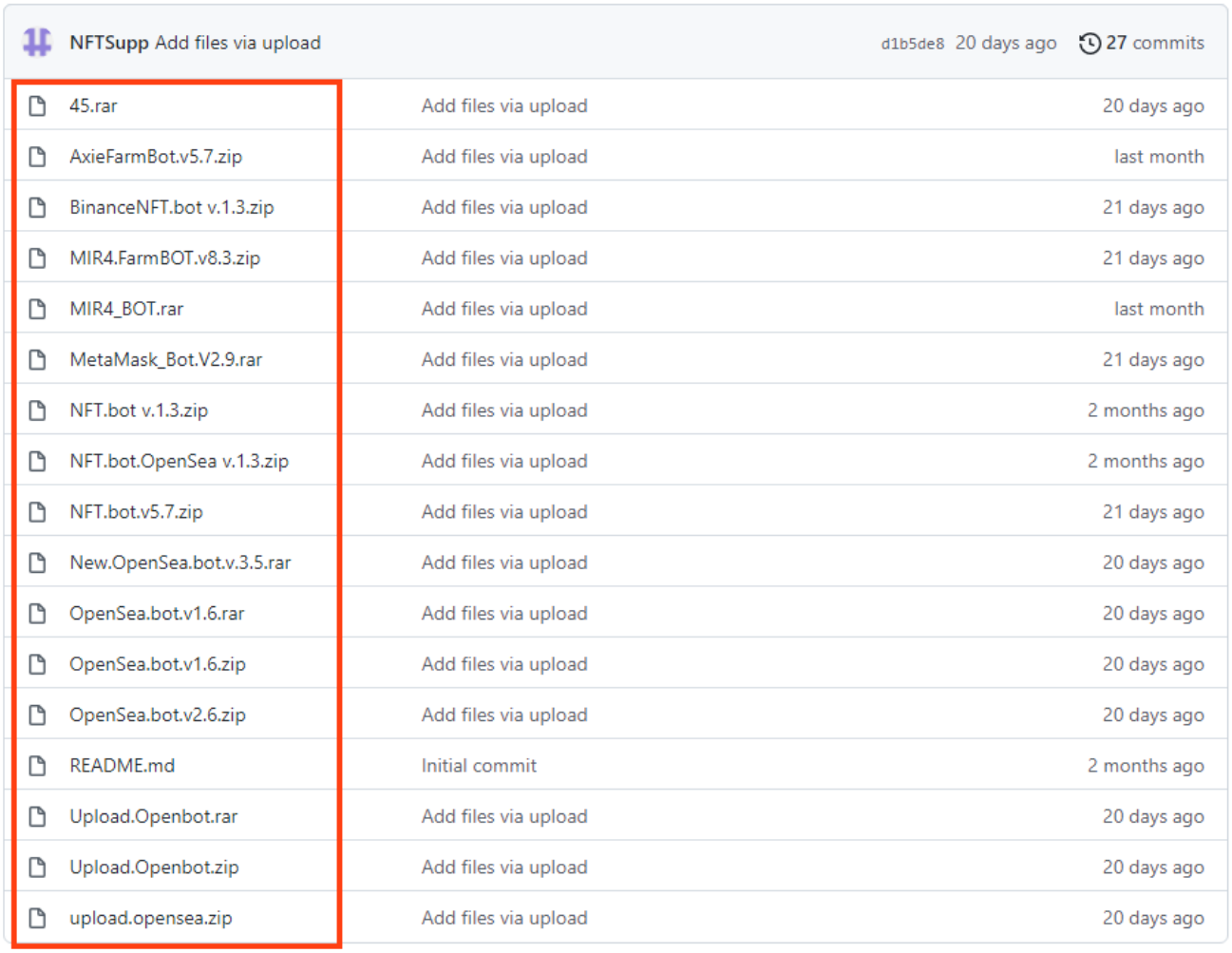
More Files From the Same Campaign

Looking at the GitHub account ("**NFTSupp**") that owns the repository where the file linked on the YouTube videos is hosted, we can see that the activities started in March, 2022.



GitHub account and repository hosting RedLine Stealer.

Aside from the files we analyzed in this blog post contained within “BinanceNFT.bot v.1.3.zip”, there are **15 additional** compressed files hosted in the same repository (“**NFTBOT**”), where **two of them** are password protected (“45.rar” and “Upload.Openbot.rar”).



NFTSupp Add files via upload	d1b5de8 20 days ago	27 commits
45.rar	Add files via upload	20 days ago
AxieFarmBot.v5.7.zip	Add files via upload	last month
BinanceNFT.bot v.1.3.zip	Add files via upload	21 days ago
MIR4.FarmBOT.v8.3.zip	Add files via upload	21 days ago
MIR4_BOT.rar	Add files via upload	last month
MetaMask_Bot.V2.9.rar	Add files via upload	21 days ago
NFT.bot v.1.3.zip	Add files via upload	2 months ago
NFT.bot.OpenSea v.1.3.zip	Add files via upload	2 months ago
NFT.bot.v5.7.zip	Add files via upload	21 days ago
New.OpenSea.bot.v.3.5.rar	Add files via upload	20 days ago
OpenSea.bot.v1.6.rar	Add files via upload	20 days ago
OpenSea.bot.v1.6.zip	Add files via upload	20 days ago
OpenSea.bot.v2.6.zip	Add files via upload	20 days ago
README.md	Initial commit	2 months ago
Upload.Openbot.rar	Add files via upload	20 days ago
Upload.Openbot.zip	Add files via upload	20 days ago
upload.opensea.zip	Add files via upload	20 days ago

Compressed files within the same repository.

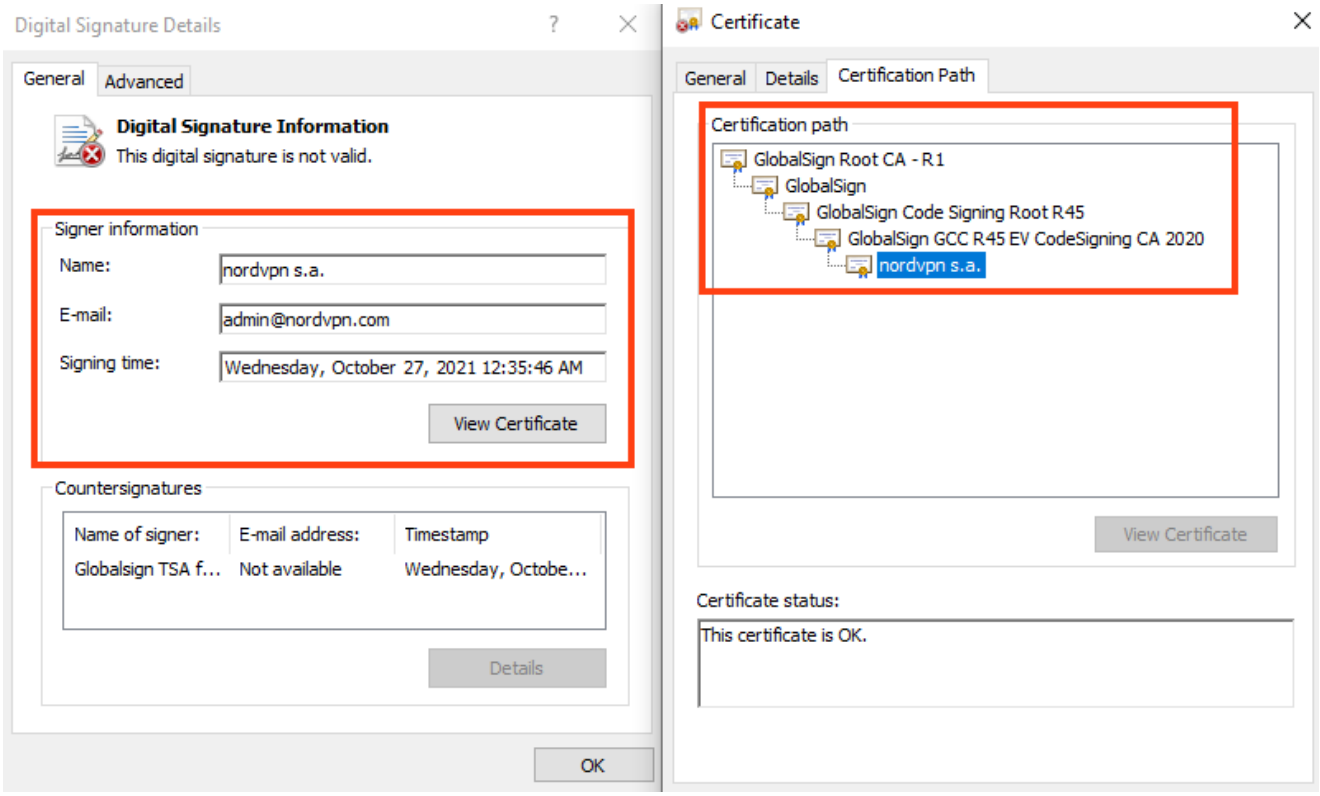
Within these compressed files, we found **five distinct** RedLine Stealer loaders.

Filename	MD5
AxieFarmBot.v5.7.exe	4d77e265722624b5d4d1841d45c7c677
OpenSea.bot.v1.6.exe	500a62b980fe1089beb63e14d61b244a
OPENSEA.Nft.bot.exe	500a62b980fe1089beb63e14d61b244a
BinanceNFT.bot v.1.3....	8c24b7746d006c63db615dd43187651b
MetaMask_Bot.V2.9.exe	8c24b7746d006c63db615dd43187651b
MIR4.farmbot.v8.3.exe	8c24b7746d006c63db615dd43187651b
NFT.bot.v5.7.exe	8c24b7746d006c63db615dd43187651b
OpenSea.bot.v.3.5.exe	8c24b7746d006c63db615dd43187651b
OpenSea.bot.v2.6.exe	8c24b7746d006c63db615dd43187651b
Mir4_Bot.v1.9.exe	d3f749cc20369e215d59f9d8bfde1a41
OpenSea Bot.exe	d3f749cc20369e215d59f9d8bfde1a41
OpenSea Bot2.exe	d3f749cc20369e215d59f9d8bfde1a41
OpenSea.bot.v1.62.exe	f0d654709884789 21ff40b6fb3def616

Different RedLine Stealer loaders in the same repository.

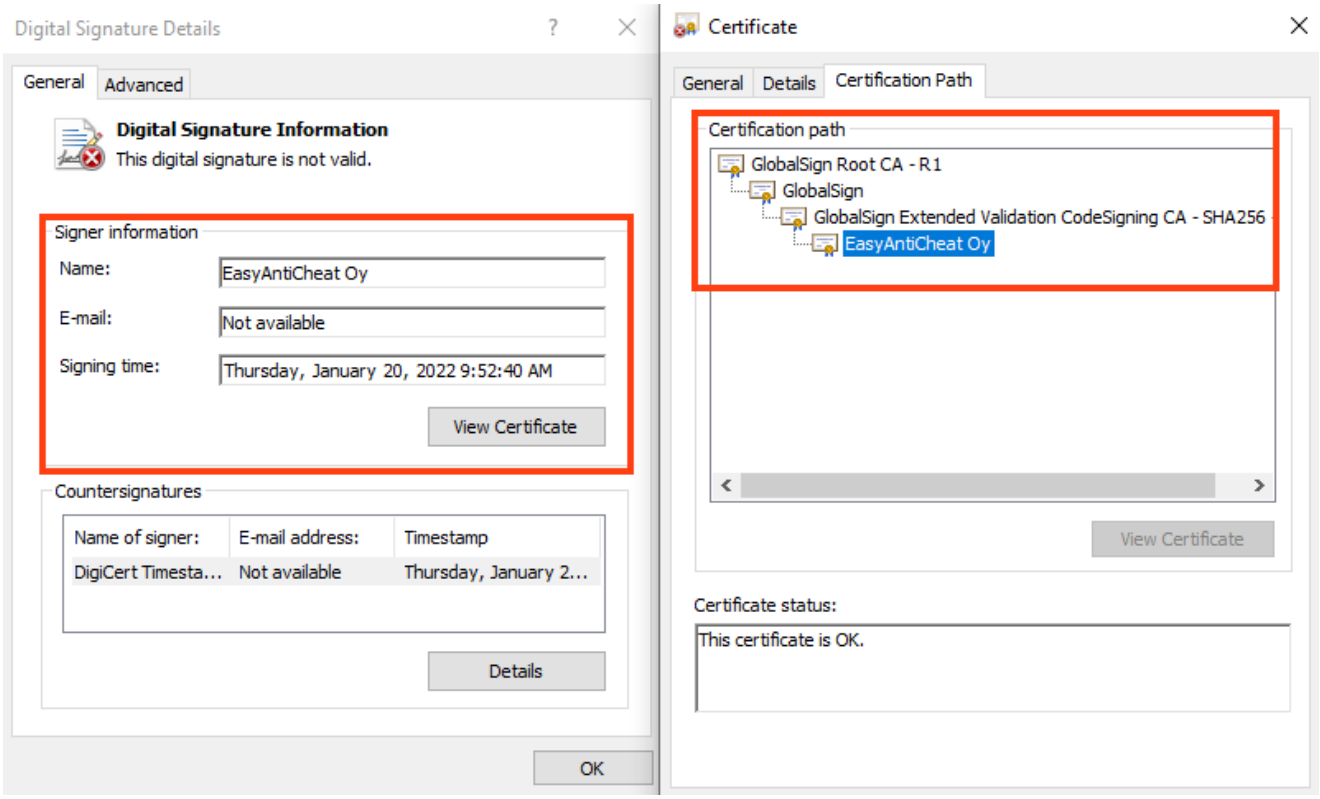
All five loaderswe analyzed are slightly different, but they all unpack and inject RedLine Stealer in a similar way, as we described earlier in this analysis. The oldest sample we found was likely compiled on **March 11, 2022** and the newest one on **April 7, 2022**.

Furthermore, two out of five files are digitally signed, which may bypass some antivirus engines. The first one seems to be using a signature from "NordVPN S.A."



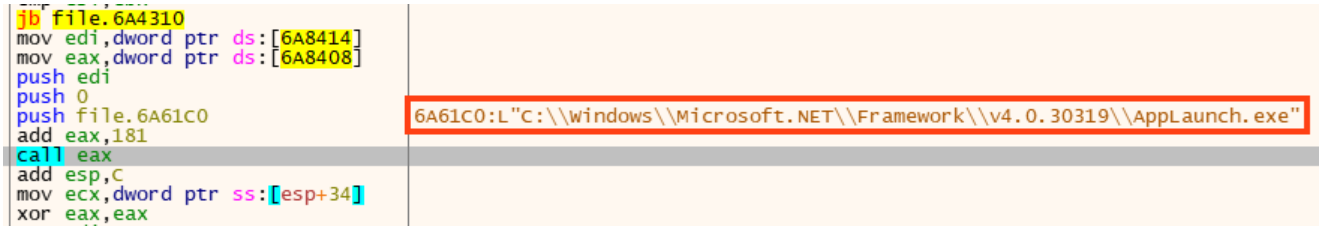
RedLine Stealer digitally signed.

And the second is signed for "EasyAntiCheat Oy".



RedLine Stealer digitally signed.

Also, one of the loaders is injecting the payload into “**AppLaunch.exe**” instead of “**RegSvcs.exe**”.



RedLine Stealer being injected into AppLaunch process.

We found **four distinct** RedLine Stealer payloads from these **five loaders**, which are all sharing the same C2 address.

Conclusions

Although RedLine Stealer is a low-cost malware, it offers many capabilities that could cause serious damage to its victims, such as the loss of sensitive data. RedLine Stealer was already known for abusing YouTube videos to spread through fake themes, however, we saw in this campaign that the attacker is also abusing GitHub in the attack flow, to host the payloads.

Protection

Netskope Threat Labs is actively monitoring this campaign and has ensured coverage for all known threat indicators and payloads.

- **Netskope Threat Protection**
  Win32.Trojan.RedLineStealer
- **Netskope Advanced Threat Protection** provides proactive coverage against this threat.
  - Gen.Malware.Detect.By.StHeur indicates a sample that was detected using static analysis
  - Gen.Malware.Detect.By.Sandbox indicates a sample that was detected by our cloud sandbox

IOCs

All the IOCs related to this campaign and the Yara rules can be found in our GitHub repository.